

Navy Communications Satellite Programs

Office of Congressional and Public Affairs
Space & Naval Warfare Systems Command
4301 Pacific Highway, San Diego, CA 92110



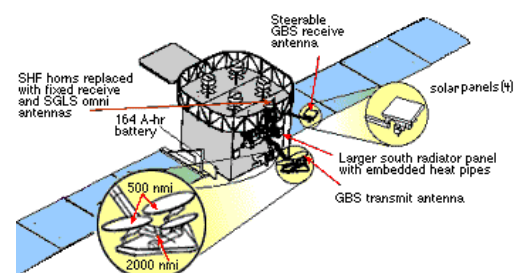
UHF Follow-On Global Broadcast Service (GBS)



In order to meet the communications demands of a rapidly deployed, highly mobile force structure, today's warfighter demands a robust, high data-rate information infrastructure to support ever-changing needs. Information flow must be dynamically configurable and rapidly adaptable to peace and wartime circumstances. It must also be delivered to theaters of operation worldwide.

High-power satellite transponders, which provide high-speed, wideband, simplex broadcast signals, characterize a Global Broadcast Service (GBS). Information is disseminated to small, 1-meter-diameter, mobile, and affordable tactical terminals. Broadcast management centers provide the information management to package, schedule, and deliver the broadcast products. They also respond to user information requests from the field. Typical information products include video, mapping, charting and geodesy, imagery, weather, and digital data. To provide an interim GBS capability, the U.S. Navy has contracted with [Hughes Space and Communications Company \(HSC\)](#) to add GBS capabilities to the UHF Follow-On (UFO) satellites 8, 9, and 10, the last three scheduled satellites in a series of 10. HSC is building the satellites under a total \$1.9 billion contract with the Navy, and its procurement agent the Navy Communications Satellite Program Office (PMW 146), of the Space & Naval Warfare Systems Command (SPAWAR) in San Diego.

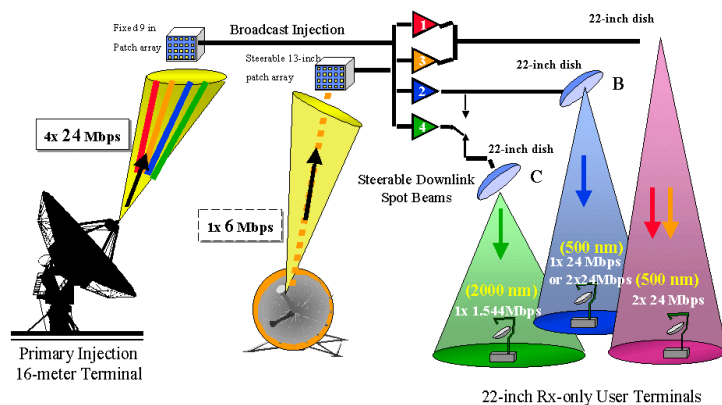
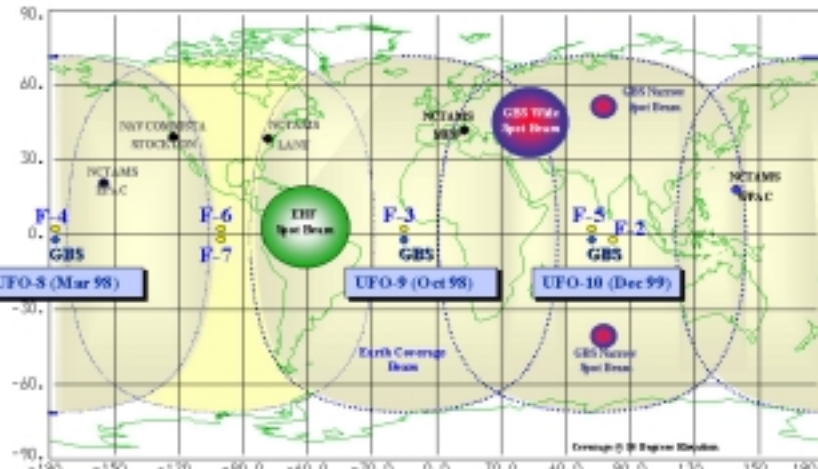
To integrate the GBS payload requires several spacecraft modifications. The payload's high-power amplifiers are integrated onto a larger south radiator panel with heat pipes added to accommodate the increased thermal dissipation. The GBS fixed receive antenna together with the forward Space Ground Link System (SGLS) omni antenna are mounted on the structure which previously supported the Super High Frequency (SHF) antennas. The GBS steerable receive antenna is mounted on a deployable boom. A new pallet structure integrates the three GBS transmit spot beam antennas. The power subsystem has been modified to provide additional capacity to support the high-power GBS payload. The battery capacity has been increased to support eclipse operations. All of the spacecraft bus changes were made with commercially proven space hardware, readily available at HSC.



This space segment GBS package, while derived from a commercial system, is entirely within the Defense Department's control. The first payload was implemented in time for a launch of UFO F8 March 16, 1998. Full, three-satellite operational capability will provide the DOD with near global coverage.

UFO GBS Coverage

The GBS payload replaces the current SHF X-band payload with four 130-watt, 24 mega-bits-per-second (Mbps) military Ka-band (30/20 GHz) transponders. This modification results in a 96 Mbps capability per satellite. The figure below shows the types of services that can be provided by one 24 Mbps spacecraft transponder, a vast increase over today's warfighter capability.



Data is received by the satellite via a fixed receive antenna from a broadcast management center (primary injection point) and a steerable receive antenna from theater injection point(s). Each of the four transponders can be accessed through either of the receive paths, configured by ground command. Data is transmitted on three steerable spot beam antennas per spacecraft into 1-meter ground terminal antennas. Each of two spot beams covers an area of 500 nautical miles in diameter at the sub-satellite point and supports data rates of up to 24 Mbps per transponder,

with two transponders assigned to each of the spot beams. The third downlink spot beam covers an area of 2,000 nmi in diameter at the sub-satellite point, supporting a data rate of 1.5 Mbps. One of the transponders is switchable by ground command from the 500 to the 2000 nmi spot beam.

The GBS payload addition to the UFO spacecraft provides the space segment for the interim Global Broadcast Services. The important ground systems for GBS are being provided under a separate contract managed by the GBS Joint Program Office. Naval ship and shore installation receive terminals are provided by the SPAWAR Navy Satellite Communications Program Office (PMW 176). With the addition of the GBS payload to the existing UHF and EHF payloads, the UFO satellite system provides broader and greatly increased satellite communications capability to support the information warfare needs of present and future warriors.

For further information, please contact

Navy Communications Satellite Program Office (PMW 146): <http://www.pmw146.navy.mil/>

GBS Joint Program Office: <http://www.gbsjpo.net/index.html>

Navy SATCOM Program (PMW 176): <http://pmw176.spawar.navy.mil/>

Hughes Space & Communications Company: <http://www.hughespace.com/home.html>

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<http://www.spawar.navy.mil/>